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10/581,573	06/02/2006	Nam-Seok Roh	PNK0337US	4907
23413 7590 09/15/2010 CANTOR COLBURN LLP 20 Church Street 22nd Floor Hartford, CT 06103				
EXAMINER RAINEY, ROBERT R				
ART UNIT		PAPER NUMBER		
2629				
NOTIFICATION DATE		DELIVERY MODE		
09/15/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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**Advisory Action  
Before the Filing of an Appeal Brief**

**Application No.**

10/581,573

**Applicant(s)**

ROH ET AL.

**Examiner**

ROBERT R. RAINEY

**Art Unit**

2629

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 25 August 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.  
b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.  
Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**NOTICE OF APPEAL**

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

**AMENDMENTS**

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because  
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);  
(b) ☐ They raise the issue of new matter (see NOTE below);  
(c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or  
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).  
5. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.  
6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).  
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.  
The status of the claim(s) is (or will be) as follows:  
Claim(s) allowed: \_\_\_\_\_.  
Claim(s) objected to: \_\_\_\_\_.  
Claim(s) rejected: 5-7.  
Claim(s) withdrawn from consideration: \_\_\_\_\_.

**AFFIDAVIT OR OTHER EVIDENCE**

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).  
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).  
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

**REQUEST FOR RECONSIDERATION/OTHER**

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:  
See Continuation Sheet.  
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). \_\_\_\_\_.  
13. ☐ Other: \_\_\_\_\_.

/Quan-Zhen Wang/  
Supervisory Patent Examiner, Art Unit 2629

/R. R. R./  
Examiner, Art Unit 2629

Continuation of 11, does NOT place the application in condition for allowance because:

Applicant's arguments filed 8/25/2010 have been fully considered but they are not persuasive.

Beginning at the last two paragraphs of page 5 applicant offers arguments that, although the prior art device offered only six choices of subpixel colors – R, G, B, C, M or Y – to replace with white, one of ordinary skill in the art could NOT have pursued the known potential solutions/replacements, with a reasonable expectation of success. Examiner does not find the arguments persuasive for the reasons set forth below.

Applicant argues, "Firstly, as is well known in the art, a complete set of primary colors for generating all colors by combination consists of a complete set of R, G and B, or a complete set of C, Y and M."

It would be more accurate to say that it is known that a complete set of R, G and B or a complete set of C, Y and M represents a minimum set of color components required to generate an acceptable range of colors for "full color" images. (For the purposes of these arguments any reference to a color component refers to one of RGBCY or M.)

Applicant argues, "However, contrary to this common knowledge, the claimed invention includes one of the complete set of RGB and CYM subpixels being completely replaced with a white (W) element, such that the replaced color subpixel does not exist within the pixel."

Examiner appreciates applicant's description because it provides examiner with insight into the reason for the disagreement between his viewpoint and that of the applicant. Examiner's position is that the replacement of one of the color components with white would be contrary to common knowledge only if the display's color set consisted of only RGB or only CYM. In either of those cases the color gamut of the display would be unacceptably harmed by the replacement of one of the primary colors by white. However, once one has more than three color components one can maintain an acceptable color gamut even after replacement of one of the color components by white as long as the display continues to contain either a full set of RGB or a full set of CYM. Since the Ben-David display utilizes RGBCYM, eliminating any single color component does not reduce the number of color components unacceptably, since the display still contains at least RGB or CYM. Note that Ben-David, when considered as a whole as applicant advises examiner to do, teaches both RGBY and RGBCY as color component sets useable for image displays (see for example Fig. 8 and 9 and [0077] and [0078]).

Applicant argues, "For example, in the specification of the present invention, it is described that when cyan and yellow pixels are added to red, green and blue pixels, color reproducibility is improved but a magenta pixel is not effective to improve color reproducibility. Accordingly, adding a white pixel instead of the magenta pixel is helpful for increasing luminance. (See, FIGS. 11 and 12 and paragraphs [108] - [110] of the specification.)"

As noted above, Ben-David teaches that a magenta color component is not required for an acceptable image display quality.

Applicant argues, "Ben-David teaches an arrangement of six subpixels within a pixel, including a complete set of both RGB and CYM color subpixels within each pixel, for example, in Figures 12A and 12B. (See, also paragraphs 0084 and 0085 of Ben-David.) Ben-David specifically includes a complete set of each of the primary colors RGB and CYM in paragraphs 0084 and 0085, for example, as each vertical subpixel pair can individually reproduce white by R+C, G+M and B+Y by arranging each primary color subpixel vertically adjacent to a complementary primary color subpixel.

That is, there is no suggestion or motivation in Ben-David or to one of ordinary skill in the art for replacing one of the colors of a primary color set with white, to as to teach the first- color and the second-color subpixels have complementary relation and wherein a group consisting of the first-color subpixels include red green, and blue subpixels and a group consisting of the second-color subpixels include cyan, white, and yellow subpixels, since reproducing white is already achieved by the specific teachings of complementary primary color subpixels in Ben-David."

The argument that one would not be motivated to add white pixels to a display because white may already be produced by combinations of color components of the display is not persuasive at least because Elliott was motivated to add white to an RGB display and white may already be produced by combination of RG and B. Further, this argument is against Ben-David in isolation rather than against the combination as presented.

Applicant argues, "Elliott merely discloses either R, G, B or R, G, B, W repeat cell arrangements in FIG. 13 of Elliott relied upon by the Examiner. (See paragraphs [0074]-[0069]). There is no disclosure of C, M or Y subpixels, let alone using a W subpixel instead of an M subpixel as claimed. Furthermore, there is no disclosure of using a W subpixel in place of either an R, G, or B subpixel, and thus no disclosure of replacing one of the six subpixels (R, G, B) with a white element as suggested by the Examiner. At most, Elliott merely discloses RGB or RGBW six subpixel repeat cell arrangements in FIG. 13 of Elliott relied upon by the Examiner."

Here applicant offers an overly limited view of the teachings of Elliott, with which examiner does not agree and is further an argument against Elliott in isolation rather than against the combination as presented.

Applicant argues, "Additionally, Elliott merely ...

That is, there is no suggestion or motivation in Elliott or to one of ordinary skill in the art for replacing one of the colors of a primary color set with white ... since Elliott specifically teaches maintaining a complete set of primary color subpixels and merely adds a white element to the arrangement without any expressed purpose or rationale."

A closer reading of the combination provides that Elliott was relied upon, inter alia, to teach the replacement of a color pixel within a six-pixel-repeat-group. And is an argument against Elliott in isolation rather than against the combination as presented. As applicant points out, Elliott does not completely replace any one of the three color components present in the display. So, stated in terms of color components, Elliott adds W to the RGB color component set of the display, thus maintaining an appropriate color component set. An appropriate

color component set is also maintained in the combination as presented. As for Elliott offering no expressed purpose or rationale for adding a white element, it was well known that a white pixel is brighter than a color pixel in most liquid crystal displays and can thus improve brightness (see for example [0042] of US2005/009540, which is incorporated by reference in Elliott).

Applicant argues, "Secondly, ... As discussed above, neither Ben-David nor Elliott provides a suggestion or motivation for replacing one of the colors of a primary color set with white, to the exclusion of that replaced primary color."

This argument is not persuasive for the reasons provided above and is an argument against a reading of the art and the combination according to applicant's choice rather than against the combination as presented.

Applicant argues, "Thirdly, neither Ben-David nor Elliott provides a reason for one of ordinary skill in the art to modify or combine the references in the manner required to meet at least independent Claim 5. ... The only motivation alleged for modifying the teachings of Ben-David and Elliott is identified as since the prior art offers only six choices of six-pixel colors to replace - R, G, B, C, M or Y, one of ordinary skill in the art could have pursued the known potential solution or replacements with a reasonable expectation of success. Applicants respectfully submit that the mere fact that the teachings of Ben-David and Elliott could be so modified to arrive at the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification."

This argument is not persuasive for the reasons provided above. Applicant is correct that examiner left one step of the combination implicit rather than explicit. Examiner could have rendered the combination more clear by pointing out the reasons for adding a white pixel rather than relying on the fact that Elliott was motivated to do so, which provides an implicit teaching that there is a motivation, and on common knowledge to make that motivation clear to one of ordinary skill in the art. As pointed out above the art of record, taken as a whole, does provide express motivation.

Applicant argues, "As discussed above, the teachings of Ben-David and Elliott include an arrangement including a complete set of the primary colors RGB or CYM, respectively, and the only modification taught is merely adding a W element to an already complete set of primary colors. That is, Ben-David and Elliott are absent any teachings regarding removing one of the primary colors and then completely replace it with a white element as claimed. Therefore, the Ben-David and Elliott have not been considered as a whole, and the claimed invention is nonobvious. Reconsideration, withdrawal of the 35 U.S.C. § 103 claim rejections and allowance of Claim 5, and Claims 6 and 7 depending thereon, are respectfully requested."

This argument is not persuasive for the reasons provided above and is an argument against a reading of the art according to applicant's choice rather than against the combination as presented.

Applicant argues, "Fourthly, Applicants respectfully submit that a finding of 'obvious to try,' e.g., one of ordinary skill in the art could have pursued the known potential solution or replacements with a reasonable expectation of success, as expressed in the instant Office action, does not provide the proper showing for an obviousness determination. The requirement for a determination of obviousness is that 'both the suggestion and the expectation of success must be founded in the prior art, not in applicant's disclosure' (emphasis added). In re Dow Chem., 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988). That is, a determination of obviousness cannot be based on what the skilled person in the art might try or find obvious to try. Rather, the proper test requires determining what the prior art would have led the skilled person to do."

As pointed out above and in the previous office action, the suggestion to include a white pixel as a replacement for a color pixel in a six-pixel-repeat-group was present in the prior art. Further, examiner's reading of KSR indicates that a determination of obviousness based on what the skilled person in the art would find obvious to try, as in for example choosing from a finite number of identified, predictable solutions with a reasonable expectation of success, is appropriate.

Applicant argues, "Since the teachings of Ben-David and Elliott as a whole, are contrary to the teachings of the claimed invention as a whole, there exists no suggestion or motivation for replacing one of the colors of the primary color sets (RGB or CYM) in Ben-David or Elliott with white, to the exclusion of that replaced primary color to teach the claimed invention. Therefore, the claimed invention is nonobvious."

As pointed out above, the combination as presented is not contrary to the teachings of Ben-David and Elliott as a whole.

Applicant argues, "Fifthly, the requirement for a determination of obviousness is that 'both the suggestion and the expectation of success must be founded in the prior art, not in applicant's disclosure' (emphasis added). In re Dow Chem., 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988). ... one must consider both the invention and the prior art 'as a whole,' 'not from improper hindsight gained from consideration of the claimed invention. ... so that their teachings are applied in the context of their significance to a technician at the time - a technician without our knowledge of the solution.'"

Rephrasing the teachings of Elliott relied upon in the combination as presented in terms of applicant's arguments in an effort to advance prosecution, we see that Elliott teaches to add white (W) to a primary color set by including a white pixel and five primary color pixels, which color pixels as a group comprise an appropriate set of color components for image display, in a six-pixel-repeat-group by replacing a color pixel in an existing six-pixel-repeat-group of color pixels with a white pixel. Which is motivated as described above and thus does not involve improper hindsight.

Would one of ordinary skill in the art at the time of the invention have had a reasonable expectation of success in applying the teaching of Elliott to the RGBCMY six-pixel-repeat-group of Ben-David rather than to the RGBRG six-pixel-repeat-group as shown in Elliott? Applicant's argument against obviousness is that it would be contrary to common knowledge to use less than RGBCMY. For the reasons pointed out above, examiner disagrees with this argument. The amount of experimentation, six combinations, required to test the characteristics of displays in which each of the color components is replaced in turn does not seem excessive. Further, Ben-David, taken as a whole, which teaches both RGBY and RGBCY as appropriate color component sets for image display, increases the expectation of success for finding a subset of RGBCMY, which is appropriate for image display. Since the five-component subset taught by Ben-David is the subset of the claimed invention it does not seem unreasonable to assume that the claimed subset would be arrived at.

Applicant argues, "Since the teachings of Ben-David and Elliott as a whole, are contrary to the teachings of the claimed invention as a whole, there exists no suggestion or motivation for replacing one of the colors of the primary color sets (RGB or CYM) in Ben-David or Elliott with white, to the exclusion of that replaced primary color to teach the claimed invention. Therefore, the claimed invention is nonobvious. Reconsideration, withdrawal of the 35 U.S.C. § 103 claim rejections and allowance of Claim 5, and Claims 6 and 7 depending thereon, are respectfully requested."

The argument that the combination is contrary to the teachings of Ben-David and Elliott taken as whole is not persuasive for the reasons provided above and is an argument against a reading of the art according to applicant's choice rather than against the combination as presented. Thus, given the limited experimentation required and the guidance presented in the prior art as presented in the combination and further described above the skilled practitioner would have had a reasonable expectation of success.

The remaining arguments, which start on page 10, as well as those not expressly addressed above, if any, either repeat arguments already answered or are based upon agreement with the answered arguments and are thus not persuasive.

In an attempt to further prosecution examiner offers key elements of the combination-as-presented in a more concise form:

Ben-David teaches the advantageous addition of "bright" primary colors consisting of one or more of CM and Y to a core set of primary colors consisting of RG and B.

RGB becomes RGB

RGB CMY

And Ben-David also teaches that a set of primary colors comprising RGBCY may be advantageously applied in image display.

Elliott teaches the advantageous replacement of one primary color pixel in a six-pixel-repeat-group of primary colors with a white pixel.

RBG becomes RBG

GBR GWR

Desirous of providing the display of Ben-David with the advantages of a white pixel as described by Elliott, one of ordinary skill could have pursued each of the known replacements, since there are only six, with a reasonable expectation of success, since the methods of testing displays against known image quality criteria were well known. The expectation of success is further increased by the knowledge, as provided by Ben-David, that RGBCY comprises a desirable primary color set for image display.

Perhaps it would have been clearer for examiner to have started with the six-pixel-repeat-group of Elliott, which adds one white pixel to a set of five primary color pixels consisting of three primary colors, and then bring in Ben-David to teach the replacement of three primary colors by five primary colors. But, whether one starts with Ben-David and adds Elliott or starts with Elliott and adds Ben-David, their teachings, taken as a whole, render the claimed invention obvious.

For the above reasons, the rejections are maintained.